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Creating Competitive Advantage in Large Organizations Using Knowledge Management

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Abstract: Today, more than ever, large organizations must efficiently manage their knowledge assets in order to remain competitive. Knowledge grows in value the more it is used. This paper provides implementation guidelines based on the knowledge life cycle, theoretical and practical benefits, challenges and the competitive advantages of successful knowledge management.

INTRODUCTION

Knowledge management (KM) is critical to organizations today. For many large corporations it is their lifeblood. KM turns real-life work experiences, hidden practices, facts and know-how into an organizational resource. Peter Drucker stated that, "knowledge is the most important resource – more important than labor, capital and land – and, indeed, the only meaningful resource today" (Gore & Gore, 1999, p. S555). Realizing the growing importance of managing knowledge, progressive corporations have begun to proactively implement Knowledge Management Systems (KMS). Corporate knowledge can no longer lay dormant, hidden from those who need it most. Corporations now realize the knowledge employees possess must be exploited to its fullest by identifying what knowledge is vital to securing and sustaining a competitive advantage.

As large companies adapt to the new millennium, they will encounter smaller, more aggressive, agile firms determined to steal their market share. The question then arises, how do large organizations create or sustain their competitive advantage? "The ability of firms to outperform the marketplace rests on the continuous generation and synthesis of collective, organizational knowledge" (Brown & Duguid, 1998, p. 91). As Drucker pointed out, economies of scale are no longer enough. KM is now widely recognized as a primary source of competitive advantage. Hence, in this paper, two assumptions concerning KM are made. First, knowledge is worth managing, although it may be difficult to quantify its value. Secondly, in order to create and sustain a competitive advantage, an organization must manage knowledge. This requires that its employees and management are willing to manage it, and adequate resources are available to do so. Large organizations were selected for study for two reasons. First, they most likely inefficiently manage their knowledge assets due to their size. Many hierarchical levels or functional divisions filter or block the flow of knowledge throughout the organization. Second, large organizations have the most to lose. Inefficiently managed firms with established market share are prime targets for attack from new, innovative and agile competitors. KM is also a relatively new concept, which new firms are more likely to adopt naturally but that larger, more established firms must adopt in order to remain competitive.

This paper provides an understanding of knowledge and its management, including its evolution and different types of KMS. Afterwards, theoretical and practical benefits of KM are illustrated, followed by a description of the knowledge management life cycle. Guidelines, created by examining KMS critical success factors, are then provided for the implementation of KM, along with potential challenges faced by organizations undertaking knowledge management initiatives, as well as the associated costs. This research concludes with a summary of the competitive advantages gained by successful KM. Throughout the paper, examples of organizations are incorporated that have either neglected or successfully implemented a KMS. Obviously, the knowledge contained within a KMS depends on company specific issues such as its size, the industry in which it competes, its culture as well as products and services it provides. However, certain factors are essential to the success of all KMS.

EVOLUTION OF KNOWLEDGE AND ITS MANAGEMENT

One controversial issue surrounding the field is what constitutes knowledge. To clarify what constitutes knowledge, it is helpful first to distinguish the differences between data and information. Words and numbers taken out of context represent data. Once context is added, data becomes information. Information applied by people based on their experience and judgment creates knowledge. For example, 0116435552762 is data. When placed in a context, such as an international phone number, it now has more meaning and can be construed as information. When a person recognizes the number is for the Walker residence in New Zealand, it becomes knowledge. Data, information and knowledge can be further distinguished by how each is transferred. Data and information can be transferred through information technologies, but knowledge requires human involvement in addition to information technology during both development of new knowledge and modifying existing knowledge (Grover & Davenport, 2001).

Distinguishing knowledge from data and information allows it to be studied as a separate entity. Alavi and Leidner define knowledge from five perspectives (Alavi & Leidner, 2001): a *state of mind* – knowledge from experience, an *object* – something to be

stored and utilized, a *process* – knowing resulting in action, a *condition to access information* – ease of access to retrieve information, and a *capability* – ability to influence upcoming action. Which perspective is taken changes how one views knowledge.

Knowledge management (KM) is critical to sustaining competitive advantages but what exactly does it entail? Several different definitions have emerged in the literature. Alavi and Leidner state "knowledge management refers to the identifying and leveraging of the collective knowledge in an organization to help the organization compete" (Alavi & Leidner, 2001, p. 114). Jarvenpaa and Staples take a more asset based view when they define it as involving "managing organization knowledge as a corporate asset and harnessing knowledge creation and dissemination as key organization capabilities" (2001, p. 152).

Successful firms depend heavily on leveraging existing knowledge for competitive advantage. Knowledge is carried in many venues such as people, policies, and culture (Alavi & Leidner, 2001). Existing knowledge can be seen in best-in-class practices, work efficiencies, and work groups. While knowledge already exists in organizations, many firms are not maximizing its benefits since it is seldom shared across the organization. In fact, an organization's culture may hinder the development and transfer of new knowledge and innovation.

One approach to knowledge management seen in industry today is that of "knowledge investment" (Earl, 2001). The critical component of knowledge investment is that knowledge is not only factual data, but also an experience which must be validated by experts before becoming official and shared (Earl, 2001). By taking this expertise and learning how to manage it, companies potentially gain a great competitive advantage.

"Knowledge as an asset" focuses on using the organization's knowledge to produce revenue and can be accomplished through tasks that reorganize patent and trademark usage and maintenance (Earl, 2001). As such, managing intellectual property is critical. However, this approach sometimes places too much emphasis on knowledge as an object that can be manipulated. Instead, KM strategies should incorporate the individuals who generate and work with the data, information and knowledge.

Knowledge management projects aim to demonstrate the importance of KM, create a culture and organizational infrastructure that supports KM. Its popularity can be attributed to the philosophy that performance is enhanced when people possess knowledge about their assigned tasks (Earl, 2001). The critical factors of this philosophy are that knowledge and information must be available to everyone and that the flow of information is unrestricted. Knowledge management creates a shared understanding of the organization's systems, both internal and external and how they interact (Fahey & Prusak, 1998). The key is for decision-makers to find how they can utilize knowledge management as a means to unify people.

BENEFITS OF KNOWLEDGE MANAGEMENT

From an economic perspective, knowledge is unique. Whereas the supply of labor and capital is fixed, knowledge is infinite. Thus, the potential for sustained economic growth through knowledge management is practically unlimited. Knowledge, and consequently KM can be a primary source of competitive advantage.

Consider the effect of a few successful Internet companies. Within five years they have transformed how we shop, look for jobs, communicate and manage our investments – at the expense of more established firms. Similarly, knowledge asset-based companies frequently experience higher market values and expected growth rates than companies with much larger physical assets. Consider the value of knowledge as opposed to physical assets. Microsoft and General Motors (GM) provide an excellent comparison (Stewart *et al*, 2001). Microsoft has a current market value of over $400 billion. This value is many times its annual revenue and is achieved with approximately 30,000 employees. GM, on the other hand, is a company with billions of dollars in fixed assets (e.g., buildings, equipment, and inventory). GM employs 600,000 people and has a market value less than its annual revenue and a fraction of that of Microsoft.

Effectively managing knowledge helps a company do one or more of the following: foster innovation by encouraging the free flow of ideas, improve customer service and response time, boost revenues by getting products and services to market faster, enhance employee retention by recognizing and rewarding them for their knowledge, and reduce costs by eliminating redundant or unnecessary processes (Santosus & Surmacz, 2001).

The space shuttle Challenger and Wells Fargo Financial, Inc. provide sobering examples of the costly consequences of inadequately and improperly managing knowledge. On January 28, 1986, NASA launched the space shuttle Challenger. Moments after lift-off, rocket booster O-ring joint seals burst, and the subsequent explosion killed all seven astronauts on board. However, at 5:45 pm on January 27, Thiokol, Inc. (the contractor responsible for the rocket booster) objected to the launch, citing engineers' lack of confidence in the O-rings in cold weather (Fisher & Kingma, 2001). Roger Boisjoly, the foremost expert on the O-rings, wrote letters and made midnight phone calls in an unsuccessful attempt to stop the launch (Fisher & Kingma, 2001). The knowledge existed and was documented by Thiokol and Mr. Boisjoly concerning the potential danger associated with the O-rings under these circumstances but that knowledge was never conveyed to senior management.

Wells Fargo Financial, Inc. is the consumer finance division of Wells Fargo National Bank, Inc. The division consists of hundreds of very small (four to eight employee) branches reporting to corporate headquarters. The managerial structure is a strong top-down hierarchy of regional, district and branch managers. In the winter of 2001, the Rochester, NY branch was the district leader in credit cards and home equity loans due to specific sales techniques. The company, however, made no attempt to replicate the branch's success, a practice called internal benchmarking. A KMS could easily have transferred the knowledge of a single branch horizontally (to hundreds of fellow branches across the country), as well as vertically (to corporate headquarters).

THE KNOWLEDGE LIFE CYCLE

These examples demonstrate how companies can benefit, and hence increase competitiveness from knowledge management. But why should companies implement knowledge management initiatives? While this question is tossed around at the management levels of organizations, the answer is clear. In order to function effectively and efficiently, knowledge must be managed and accessible. "Whereas we might have said in the industrial age, 'give the workers the tools to do the job,' we now might say 'give knowledge workers the knowledge and information to do the job'" (Earl, 2001, p. 222).

Once companies realize the importance of knowledge management, they must determine what components of knowledge are to be managed and how each can be implemented. Knowledge itself has several "life" phases: creation, documentation and storage, transfer, and reuse. Each has its own requirements for implementation.

Creation is the first phase. Through their daily activities, knowledge workers create and discover knowledge (Jarvenpaa & Staples, 2001). Knowledge creation can relate to social situations and experience as well as internal and external data and can be enhanced through team and collaborative work (Alavi & Leidner, 2001). Activities such as work discussions and casual hallway conversations all provide opportunities for exchange. Experimentation can also provide valuable insights and generate new knowledge. By challenging established policies and best practices, new creative solutions can be formed (Fahey & Prusak, 1998). However, many organizations do not seek out this type of experimentation.

Another means of obtaining new knowledge is through acquisition. Two frequent approaches to acquisition are benchmarking, which will be discussed in greater detail under knowledge reuse, and collaboration between individuals and companies (Gold *et al.*, 2001). Collaboration can include work between internal teams and/or inter-company ventures. Both these venues provide opportunities to generate knowledge by encouraging people with different backgrounds and exp eriences to come together with a common goal. Information technology that is frequently used to this end includes collaboration tools, which allow for communication without regards to geographic restrictions (Gold *et al.*, 2001).

Knowledge management initiatives designed to foster knowledge creation must be prepared to go beyond the IT structure and incorporate the human aspect, as they are the most efficient holders, creators and transmitters of knowledge in an organization (Ruggles, 1998). Corporations must recognize how knowledge can be used as a resource. This is often embodied in the corporate mission statement and drives management activities (Earl, 2001).

Documentation and storage is the second phase of the knowledge life cycle. One challenge managers face in their attempt to implement KMS is how to capture knowledge and encode it in a form that can be easily stored or transmitted. For knowledge to be documented and stored, practices and policies that encourage this activity must exist. A major problem with generating documentation stems from the unawareness of people who possess knowledge that other people may benefit from it (O'Dell & Grayson, 1998). Beyond that, both time and money must be available to foster an environment that allows a relationship to be developed between the people with the knowledge and those who need it.

Once documentation has been elicited, the company must have an infrastructure in place to support its storage. Storage takes into account various forms of knowledge, including computerized and paper documents. Speed and access to them are facilitated through the use of networks, groupware and databases (Alavi & Leidner, 2001). Information technology will play a key role in the development of effective knowledge management systems.

Knowledge transfer, the third phase, occurs at many levels, such as individual to group and group to group, and can be transferred through formal (training) and informal channels (Alavi & Leidner, 2001). "...new, unsettled knowledge is mainly shared vertically, and routine, incremental knowledge is mainly shared horizontally" (Schulz, 2001, p. 676). The corporate culture is crucial in ensuring knowledge sharing. As stated by Jarvenpaa and Staples, "Information sharing is a voluntary act of making information available to others... the sharer could pass information on, but doesn't have to." (Jarvenpaa & Staples, 2001, p. 169).

Organizational support of knowledge sharing can be achieved in different ways. While transferring people to new locations has been a traditional approach, there are several other methods that have shown success. Benchmarking teams whose function is to identify internal and external effective processes can bring solutions forward (O'Dell & Grayson, 1998). In addition, knowledge markets, or the need to reward individuals for sharing knowledge must be understood in knowledge management endeavors (Grover & Davenport, 2001). Another method of providing organizational support is to create functional teams to encourage knowledge sharing. The encouragement of sharing requires that organizations willingly provide resources, feedback, and management support.

Organizational structure must also be supportive of knowledge management goals, or it can be inhibiting. An open, flexible environment is critical so that information can be shared both within the organization and across the supply chain (Gold *et al.*, 2001). Corporate mission and values statements as well as corporate objectives and incentives must be supportive of knowledge sharing.

Knowledge reuse is the fourth phase of the knowledge life cycle. Reuse focuses on accessing and utilizing knowledge repositories as well as the use of experts. The reuse of knowledge requires knowledge consumers are able to recall what and where information is stored and to be able to recognize how this information helps address problems (Markus, 2001). Benchmarking, a form of reuse can help achieve revolutionary performance (O'Dell & Grayson, 1998).

External benchmarking offers organizations guidelines for change (O'Dell & Grayson, 1998). By applying best practices developed elsewhere, externally acquired knowledge can generate substantial improvements in current processes. Another type of external knowledge reuse can be seen through acquisition. This relates to the purchase of knowledge from an outside source, such as patents (Gold *et al.*, 2001).

Internal benchmarking is another method that has its own benefits and challenges. Internal benchmarks are already tailored to a company's business and can provide excellent solutions. However, while most people desire to learn, many organizational cultures do not promote the type of behavior needed to make internal best practices known. Employees are at least implicitly, if not explicitly, encouraged to think in terms of their functional silos rather than their organization. Corporations must set up a structure that provides time and resources to utilize the wealth of information it contains.

Strategies for knowledge reuse require companies to view knowledge as inseparable from its uses. Knowledge is useful only when used. However many projects lose sight of this focus and the project technicalities become more important than why the project was initiated. Some reasons for this are (Fahey & Prusak, 1998): access to information does not equate to utility, the value of the information may not be obvious, and those who generate the knowledge are separated from the decision makers. By being aware of this problem, management can better focus and develop the structures to promote knowledge reuse.

Each life cycle stage is critical to managing knowledge. By understanding both the theory and practical implementation, knowledge management endeavors will have better focus. Table 1 provides general guidelines for implementing each phase of the knowledge management life cycle.

Knowledge Life Cycle	Implementation Steps
Creation	• Craft corporate values and mission statements • Create an organizational culture which supports knowledge creation • Institute incentives for knowledge generation • Encourage employee experimentation with new procedures/methods • Design physical environment so that people interact
Documentation	• Generate an awareness of the importance of sharing knowledge • Ensure adequate time and resources are allowed to document • Utilize incentives to encourage documentation • Establish a technology environment that supports knowledge management
Transfer	• Cultivate a sense of corporate ownership of knowledge • Ensure individuals are properly rewarded for sharing knowledge • Encourage teams to share knowledge both within and between teams • Enable an open, trusting and flexible workplace
Reuse	• Utilize benchmarking, both internal and external • Create a means (e.g., directory) for finding people who are knowledgeable

Table 1. Knowledge Life Cycle Phases and Implementation Steps

CHALLENGES OF KNOWLEDGE MANAGEMENT

Knowledge continuously changes. As with physical assets, the value of knowledge erodes over time. "Like product development, marketing and R&D, knowledge management is a constantly evolving business practice" (Santosus & Surmacz, 2001, p. 3). The contents of KMS must be regularly updated. Understanding the knowledge life cycle aids in understanding how knowledge management capabilities are linked to other aspects of organizations. If those aspects are not operating effectively, the knowledge management endeavors will not either. Once begun, it is critical to not let one aspect of the knowledge management process overpower the others, as this may be detrimental to the overall goal (Gold *et al.*, 2001). Management should also be aware that many factors effect knowledge management projects which are not necessarily linked with financial measures.

Investments in knowledge management are not always beneficial. John Seely Brown, director of Xerox Parc, notes that U.S. industry had realized little improvement in the value obtained from its knowledge workers, despite an investment in technology exceeding $1 trillion (Malhotra, 2000). Some knowledge management challenges include: employee participation, constantly updating the KMS, and sorting useful from useless information (Santosus & Surmacz, 2001). In order for knowledge management to be successful, all employees must understand that they are an integral part of the life cycle. Identifying and disseminating knowledge is not easy. Location to location transfer is only one issue. On average, it takes over two years from identification to installation of a best practice (O'Dell & Grayson, 1998).

Knowledge in overwhelming quantities creates information overload. Knowledge must be properly classified so that employees are not overwhelmed. Just as the supply of knowledge is infinite, so is the supply of useless information. Tragically, the Internet is one example. Although the Internet can be an excellent source of information, it is often difficult to find, in a simple search, exactly what one is looking for. The challenge is finding the needle in the knowledge haystack. Barriers created by functional silos and management levels hinder knowledge management.

Creating a successful project hinges on management's perception of success. The challenge with knowledge management is that the success of a project may not be something that is easily measurable. It is difficult to assign a value to knowledge (Grover & Davenport, 2001). Measurement such as cycle time and efficiency benchmarks can be used as a starting point (O'Dell & Grayson, 1998).

While management frequently seeks to quantify project success, this is not the best approach to knowledge management. Organizations tend to focus too much attention on the metrics (e.g. # of databases, and hits on the web site), rather than on the output and consequences of knowledge management activities (Fahey & Prusak, 1998). These metric activities do not provide an accurate measure of actual value and ignore the human factor. Many metrics overlook efficiencies, reduced stress, improved effectiveness and many other benefits achieved through knowledge management.

However, the biggest challenge is still the initial stages and implementation. Benchmarking can create the momentum. To gain further support, choose a project with a high pay-off that moves the corporation towards its goals (O'Dell & Grayson, 1998). Companies must make sure that each activity has the resources available for implementation and does not let competition impede progress. A reward system that encourages open transfer of knowledge and the encouragement of those in leadership positions are key components, as well as technology to support network exchanges (O'Dell & Grayson, 1998). Management must show consistent support of the initiatives to maintain effectiveness. The key points of both the benefits and challenges of knowledge management are detailed in Table 2.

Benefits of Knowledge Management	Challenges of Knowledge Management
• Fosters innovation • Improves efficiency • Improves coordination of efforts • Encourages free flow of ideas • Improves response time • Rewards employees • Improves market time • Responsive to market changes • Reduces costs Competitive Advantages = Increased Firm Value	• KM projects are not always successful • Requires full employee participation • Requires constant updating • Must sort useful knowledge from useless information

Table 2. Benefits and Challenges of Knowledge Management

COMPETETIVE ADVANTAGE

As the new economy continues evolving, organizations must adapt by better managing their knowledge assets. Competitive companies share a common set of explicit knowledge. The competitive game has just changed. It is now more how a company can leverage its knowledge, rather than possessing it, that creates competitive advantages.

Competitive pressures in the market are fostering an environment in which companies review their knowledge assets and look for ways to create value. However, many existing projects are no more than undertakings that compile information, but do not provide any innovation (Gold *et al.*, 2001). The key to gaining a competitive advantage as stated by Gold *et al.*: "Contributions [of knowledge management] include improved ability to innovate, improved coordination of efforts, ...responsiveness to market change, and reduced redundancy of information/knowledge" (Gold *et al.*, 2001, p. 196).

Competing based on knowledge management requires a company to analyze not only its data, but its culture and structure as well. Management must create an organizational infrastructure that will leverage existing knowledge in the marketplace, while developing new knowledge to sustain their position (Gold *et al.*, 2001). This ability to compete using knowledge stems from the growth in IT and resources such as the Internet, as well as from the desire to gain value from organizational information (Grover & Davenport, 2001). Organizations that effectively manage knowledge understand their strategic knowledge requirements (Alavi & Leidner, 2001), devise a knowledge strategy appropriate to their business strategy, and implement an organizational and technical architecture appropriate to the firm's needs (Brown & Duguid, 1998).

Amazon.com and e-Toys suddenly threatened their respective competitors by reaching a large pool of consumers over the Internet with minimal overhead. However, Barnes and Noble and Borders were quick to establish their own online bookstores through business process reengineering, while Toys 'R' Us was slower to respond. In these types of industries, knowledge management is a strategic tool (Malhotra, 2000). Businesses may not have time to wait for the traditional circulation of knowledge, as evidenced by the sudden loss of Toys 'R' Us market share to e-Toys. Instead, e-businesses rely on tacit knowledge management and rapid, vertical knowledge transfer to strategic management.

Knowledge management is becoming a factor in the competitiveness of organizations. Knowledge management, seen as the utilization of the experience and judgment within an organization, has taken center stage in the business world today (Ruggles, 1998). Knowledge is now a key source of competitive advantage and is influencing the ways that businesses are run. As such, it is not something which companies, particularly large companies, can afford to ignore.

CONCLUSION

Knowledge is a source of competitive advantage for modern organizations. Knowledge is information in context that currently requires some degree of human involvement to create. Knowledge as a source of competitive advantage is supported by its lack of scarcity, and unlimited growth potential. Knowledge must be worth managing, able to be managed, and pose minimal risk in order to benefit an organization.

As with most worthwhile endeavors, knowledge management is challenging. It is difficult to quantify the value of a knowledge management system. The organization must create a culture that encourages full employee participation. Due to the changing nature of business, knowledge management systems must evolve. Knowledge must be separated from the abundance of useless information, particularly found on the Internet. "[Peter Drucker] remarks that the single biggest challenge is to organize external data because change occurs from the outside." (Huang *et al*, 2002, p. 26) Competitive pressures require that organizations review their knowledge assets carefully. Although challenging, the benefits of properly managing knowledge are great – improved innovation, efficiency, coordination of efforts, flow of ideas, customer service, response time, responsiveness to market change, and reduced costs, all of which create competitive advantages.

REFERENCES

Alavi, Maryam and Dorothy E. Leidner. "Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," *MIS Quarterly*, Vol. 25, No. 1, March 2001, pp. 107-136.

Brown, John and Paul Duguid. "Organizing Knowledge," *California Management Review*, Spring 1998, pp. 90-111.

Earl, Michael. "Knowledge Management Strategies: Toward a Taxonomy," *Journal of Management Information Systems*, Vol. 18, No. 1, Summer 2001, pp. 215-233.

Fahey, Liam, and Laurence Prusak. "The Eleven Deadliest Sins of Knowledge Management," *California Management Review*, Vol. 40, No. 3, Spring 1998, pp. 265-276.

Fisher, Craig and Bruce Kingma. "Criticality of Data Quality as Exemplified in Two Disasters," *Information and Management*, Vol. 39, 2001, pp. 109-116.

Gold, Andrew H., Arvind Malhotra, and Albert H. Segars. "Knowledge Management: An Organizational Capabilities Perspective," *Journal of Management Information Systems*, Vol. 18, No. 1, Summer 2001, pp. 185-214.

Gore, Chris and Emma Gore. "Knowledge Management: The Way Forward," *Total Quality Management*, Vol. 10, No. 4/5, July 1999, pp. S554-S560.

Grover, Varun and Thomas H. Davenport. "General Perspectives on Knowledge Management: Fostering a Research Agenda," *Journal of Management Information Systems*, Vol. 18, No. 1, Summer 2001, pp. 5-21.

Huang, Zhenyu, Lei-da Chen and Mark Frolick. "Integrating Web-Based Data into a Data Warehouse," *Information Systems Management*, Winter 2002, pp. 23-34.

Jarvenpaa, Sirkka L. and D. Sandy Staples. "Exploring Perceptions of Organizational Ownership of Information and Expertise," *Journal of Management Information Systems*, Vol. 18, No. 1, Summer 2001, pp. 151-183.

Malhotra, Yogesh. "Knowledge Management for E-Business Performance: Advancing Information Strategy to 'Internet Time'," *Information Strategy: The Executive's Journal*, Vol. 16, No. 4, Summer 2000, pp. 5-16.

Markus, M. Lynne. "Toward a Theory of Knowledge Reuse: Types of Knowledge Reuse Situations and Factors in Reuse Success," *Journal of Management Information Systems*, Vol. 18, No. 1, Summer 2001, pp. 57-93.

O'Dell, Carla, and Jackson C. Grayson. "If We Only Knew What We Know: Identification and Transfer of Internal Best Practices," *California Management Review*, Vol. 40, No. 3, Spring 1998, pp. 154-174.

Ruggles, Rudy. "The State of the Notion: Knowledge Management in Practice," *California Management Review*, Vol. 40, No. 3, Spring 1998, pp. 80-89.

Santosus, Megan and Jon Surmacz. "The ABC's of Knowledge Management," *CIO Magazine*, May 2001, pp. 1-5.

Schulz, Martin. "The Uncertain Relevance of Newness: Organizational Learning and Knowledge Flows," *Academy of Management Journal*, Vol. 44, No. 4, August 2001, pp. 661-681.

Stewart, Kathy, Richard Baskerville, Veda Storey, James Senn, Arjan Raven, and Cheri Long. "Confronting the Assumptions Underlying the Management of Knowledge: An Agenda for Understanding and Investigating Knowledge Management," *The DATA BASE for Advances in Information Systems*, Vol. 31, No. 4, Fall 2001, pp. 41-53.